FY 2004 President's Request

Climate Change Research Initiative

Supercomputing

Addresses

NOAA Mission Goal #2

Understand climate variability and change to enhance society's ability to plan and respond

What is requested?

NOAA requests an increase of $3.5M as part of the Procurement, Acquisitions, and Construction account request to enhance NOAA's Geophysical Fluid Dynamics Laboratory's computing capability by 35%. The request will enable simulations addressing policy and business issues, and turn NOAA's investments in the Climate Change Research Initiative (CCRI) research into policy relevant knowledge. The CCRI promotes a vision focused on the effective use of scientific knowledge in policy and management decisions. The proposed strategy emerged from a common sense of priority actions and is aligned with recommendations from the National Academy of Sciences June 2001 report entitled *Climate Change Science: An Analysis of Some Key Questions*.

Why do we need it?

Models are an essential tool for synthesizing observations and theory to investigate how the climate system works and how human activities can affect it. The U.S. Global Change Research Program and the National Research Council have identified the critical need for the human and computational resources to run ever more complex models needed to improve the state of scientific understanding and its value to decision-making. The FY04 request supports the acquisition of additional computing resources needed for the systematic generation of the model-based climate products required by the decision-makers. The Climate Modeling Center will focus on model product generation for research, assessment, and policy applications to meet the critical objectives regarding climate modeling in the U.S. These objectives include capitalizing on the strong U.S. basic research enterprise. Simultaneously, the Climate Modeling Center will produce the routine and on-demand products for the impacts, assessment and policy communities, while developing the capabilities to produce routine and on-demand, high-end, climate model simulations and projections required for other communities.

Climate Research Supercomputing At-a-Glance

What: $3.5 M increase

Why: Improved computing capability will help decision-makers make policy decisions involving climate change issues.

Office of Oceanic & Atmospheric Research, Procurement, Acquisition and Construction

For more information:

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What will we do?

The initiative will enhance GFDL's projected FY04 supercomputing capability by approximately 35% to enable a suite of model-based products to be produced. Under the request, the Climate Change Computing Initiative (CCCI) will buy a balanced mix of hardware (computing, storage, communications), software (development tools, analysis packages), and contract support required to operate and maintain the system, plus nominal facilities upgrades necessary for integration into the existing system. CCCI products will allow us to document, assess, and understand the impacts of long-term climate variability and change on the U.S. and U.S. interests abroad. These specialized runs will go beyond standard scenarios produced by the Intergovernmental Panel on Climate Change (IPCC) and will be designed in consultation with the policy and management communities. They will address specific issues, such as the following: What will the impacts be for water resources both nationally and internationally? What might be the expected impacts of climate change be in the Arctic? What impacts might be identified from scenarios other than those used for the IPCC assessments when we include more comprehensively aerosol concentrations and other short-lived radiatively active species? How will various energy and technological scenarios affect climate? What will be the regional impacts of climate change? What is the relative likelihood of various scenarios occurring?

What are the benefits?

NOAA is managing an extensive oceanic and atmospheric observing system to meet the priorities of the CCRI. More refined measurements and a wider array of observations help us to better take the pulse of climate change and variability. The computational power requested for FY04 is a critical aspect of that observational network that allows us to actually understand and use these enhanced measurements. The improved computing capability will allow decision-makers to help make optimal policy decisions involving climate change and variability issues. Climate change and variability encompasses a number of public policy issues such as energy security, public health, agriculture, and water resource management. The added computing power will help NOAA to more effectively explore carbon management strategies, attack air quality and climate change issues simultaneously, explore links between climate and extreme events and improving seasonal forecasts, better understand abrupt climate changes and verify models against paleoclimatic records, and produce regions- and sector-specific reports of climate impacts, e.g. Arctic, water resources, etc. The funding will allow NOAA to explore impacts for various strategies of energy, technological, demographic, and land use changes, as well as utilize moderately high-resolution models to resolve regionality of impacts.

FY 2004 Proposed Climate Change Research Initiative Program Components:

- Global Ocean Observing System
- Carbon Cycle Atmospheric Observing System
- Aerosols
- Climate Change Science Program Office
- Climate Change Computing Initiative

NOAA Budget FY 2004 Change

Office of Oceanic and Atmospheric Research
Procurement, Acquisition, and Construction

Climate Supercomputer
$3.5M